2. Forest Habitat

The effect of timber harvesting on forest animals is to temporarily favor those species adapted to open, early seral conditions, and to reduce or locally eliminate those adapted to later seral stages. With a large disturbance such as clearcutting, most animal populations may initially decrease because of mortality or displacement. However, the vegetation growth following clearcutting results in increased numbers of many other animal species. Small mammals that increase under these conditions include mountain beavers, pocket gophers, ground squirrels, chipmunks, snowshoe hares, porcupines, deer mice and some species of voles and shrews. Deer and elk are also attracted to early seral communities resulting from clearcuts, as are beavers, black bears, seed-eating birds and avian predators like golden eagles.

On the other hand, clearcutting temporarily eliminates animals of the dense forest in local areas, such as red-backed voles, Douglas' squirrels and martens. Small birds that glean insects from bark and foliage, like red-breasted nuthatches, chickadees and hermit warblers, also decline.

Partial cutting and commercial thinning generally produce similar but less severe local changes in animal populations. Forest openings created by partial cutting generally increases the numbers of ground and aerial-feeding birds (such as, wrens, swallows and most flycatchers) while reducing those species that feed on bark and foliage (for example, nuthatches, creepers, chickadees and kinglets). Similarly, shelterwood and selection cutting reduces woodpecker foraging in old growth forests.

3. Deer, Elk and Big Game Habitat

Timber harvesting can either benefit or harm deer and elk, depending on climate and the amount and distribution of forest cover and forage. In lowland Douglas fir forests of Washington, clearcutting has benefitted both deer and elk by creating openings that provide abundant food.

However, big game animals wintering in higher snowfall areas may be harmed by clearcutting. Deeper and more uniform snows tend to accumulate on these clearcut areas. This condition hampers the movements of deer; the snow also buries browse plants on which they depend for food. Deer seem to prefer forests where heavy tree canopies intercept much of the snowfall, allowing them better mobility and access to forage.

According to the state Department of Wildlife, the major limiting factor for lynx in Eastern Washington is snowshoe hare abundance, which in turn is limited by availability of winter hare habitat. Excessive trapping and hunting can depress lynx populations and may have been detrimental to local Washington populations. Converting some mature timber stands to early stages of plant succession will benefit lynx by creating conditions favorable to hare. Lynx management priorities should provide a mosaic of forest age classes distributed over time and space. (See Management Recommendations of Washington's Priority Habitats and Species, published by the Department of Wildlife (May 1991), Elizabeth Rodrick and Ruth Milner, Technical Editors, adopted as a reference on page ix of this document)

Timber harvesting also affects deer and elk by altering the abundance and interspersion of food and cover. Size, shape and distribution of harvest units, as well as yarding methods, are important. (Clearcuts on state forest lands currently average about 72 acres. When roughly square they are about two to three times wider than optimal for deer and elk. They are typically elongated or triangular in shape. Harvesting adjacent timber stands over shorter intervals increases the effective size of clearcuts and further reduces their use by big game.)

Animals most harmed by timber harvest are those whose habitats are not re-created under intensive forest management. Animals that nest and seek shelter in snag cavities, as well as species whose habitats are in old growth forests, fall into this category. Many species may be adversely affected in local areas, included woodpeckers, ducks, owls, songbirds, bats and other small mammals.

4. Old Growth Habitat

Old growth forests provide optimal habitat for many animals which have adapted to large living trees and other distinctive structural features. In the Forest Land Management Program (1984), the department estimated that it would harvest old growth forests on state forest lands at a rate that would eliminate them in the next 12 to 15 years.

This has not proven to the case. Recent deferrals of mature timber (see discussion of the proposed Olympic Experimental State Forest in Policy No. 6, Western Washington Ownership Groups, of the Forest Resource Plan) will likely postpone from harvest approximately 15,000 acres for the next 15 years. In addition, the department intends to defer 2,000 acres in Old Growth Research Deferral Areas (Policy No. 14) and about 2,400 acres in gene pool reserves (Policy No. 15, The Genetic Resource).

The department will continue to harvest old growth and mature older stands in areas not deferred or restricted. Harvesting old growth stands will likely reduce habitat for certain wildlife and insects. Decayed and down timber in old growth stands provides an excellent insect environment. Cutting the timber and subsequent slash abatement procedures removes much of this material. In the intensive forest management practiced on state forest lands, clearcutting is often used to remove infected stands. Partial cutting is used to remove individual infected trees. These practices may reduce habitat for some wood-boring insects.

5. Effects of Forest Health on Habitat

Most insect and disease prevention is accomplished through a variety of intensive management techniques, including regulated harvest, thinnings, planting nonhost tree species or resistant stock, and salvaging down timber. Severe insect outbreaks may occasionally be suppressed with aerial insecticides or pathogens (biological control). These control methods will decrease epidemic levels of insect population in sprayed target areas, though the populations will gradually return.

The department's Forest Health Program seeks to reduce the population of the target species. Action is taken only when that species represents a serious threat to timber resources, when the population has expanded beyond normal, endemic levels and when control measures are economically advantageous. Introduction of a biological control agent could severely impact the target species locally. There is little chance, however, that the department's control program for insects will eradicate entirely a single species on state forest land.

8.4.2.3 Endangered, Threatened and Sensitive Species of Fauna

The department's new endangered, threatened and sensitive species policy directs the department to meet the requirements of federal and state laws and other legal requirements that protect these species and their habitats.

In addition, the department will actively participate in efforts to recover and restore endangered and threatened species to the extent that this obligation is consistent with trust obligations. See Policy No. 23, Endangered Species. Also, see **Table 21** at page 87 for the list of endangered and threatened fauna found on forested land in Washington State.)

The Northern Spotted Owl

Much of the recent effort in this area has focused on the Northern Spotted Owl, which was listed by the federal government as a threatened species in 1990. The department estimates there are about 220 owl sites on state forest land (88 percent of which are occupied by a pair of owls). This number is subject to change as the department continues to conduct owl surveys.

The Federal Endangered Species Act

The federal Endangered Species Act prohibits the "taking" of owls (defined in the statute as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct). "Harm" may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. Whether or not harm has occurred is largely a biological question.

The U.S. Fish and Wildlife Service (USFWS) enforces the "take" provisions of the Act. The department is working with the USFWS and the state Department of Wildlife to ensure that it is in compliance with current regulations.

State Forest Practices Law

In addition to efforts on the federal level, the department is following Interim Owl Memorandum No. 3 issued by the department's Forest Practices Division. The memorandum identifies owl habitat, commonly known as "owl circles" because the habitat is defined by a circular area.

For each known owl site, the department is currently restricting harvest in a circular area that has a radius of between 1.8 and 2.2 miles, depending on location. The amount that can be harvested within these circles depends on the amount of available habitat within the circle.

Forty percent of the total acreage within a circle must be conserved as habitat that meets USFWS guidelines. This is equivalent to 3,972 acres for each pair of owls in circle with a 2.2-mile radius, and 2,523 acres in a circle with a 1.8-mile radius. In addition 50% of the habitat within a circle of .7 mile radius (equivalent to 500 acres of suitable habitat) must be retained. The 70 most contiguous acres of best suitable habitat around the site center must be retained.

Outside of circles, the department will sell timber where it believes the risk of "take" is low . The only current restriction in potential owl habitat outside the circles is the "taking" prohibition described above.

Department Procedure Implementation

The department reviews and classifies all planned timber sales according to the estimated habitat and proximity to known site centers. These classifications allow the department to screen potential timber sales before they are presented to the Board of Natural Resources.

The department surveys potential habitat prior to selling timber These surveys are performed using the USFWS protocol. In 1991 the department spent approximately $715,000 to survey 133 timber sales. During 1992, the department estimates it will spend about $1.5 million to survey approximately 200 proposed sales.

Using this survey information, the department categorizes potential sales in terms of the risk of a sale impacting Northern Spotted Owls. A list of planned timber sales and their risk categories are contained in **Table 33.**

Each month the monthly timber sales packets are reviewed with the Department of Wildlife for Northern Spotted Owls prior to presentation to the Board of Natural Resources for approval. After auction, and before confirmation (i.e., authorization of final award of sale), the sales are again screened for owls. If new information arises, the sale would not be confirmed by the Timber Sales Division Manager.

As of November 1991, approximately 63,250 acres of department managed land are in a circle and currently unavailable for timber harvesting. The total number of acres subject to these restrictions is subject to revision as owl surveys and legal requirements change.

TABLE 33
Review of Planned Timber Sales

Category	Number of Sales
1	2 (1%)
2	9 (5%)
3	24 (15%)
4	87 (53%)
5	43 (26%)

Description of Categories:

1: Any sale involving suitable spotted owl habitat within 1.8 or 2.2 miles of a known spotted owl site center (nest or other activity center). The department will proceed only if a survey has been completed and an approved habitat evaluation exists showing the existence of more than 40% potential habitat within the circle. If a survey has not been completed or less than 40% habitat remains, the sale will not be sold.

2. Any sale involving Type A or B suitable spotted owl habitat (see definition below) within 5 miles of a known spotted owl site center and not in a circle. The department will proceed only if a survey has been completed and no owls found. (If owls are found during the survey, the sale will proceed only if more than 40% suitable habitat exists within any new circles that may be established).

3. Any sale involving Types A or B suitable spotted owl habitat farther than 5 miles from a known spotted owl site center or any sale involving Type C suitable spotted owl habitat less than 5 miles from a known spotted owl site center. The department will proceed only if a survey has been completed and no owls are found.

4. Any sale involving type C suitable spotted owl habitat farther than 5 miles from a known spotted owl site center. The department will proceed without a survey.

5. Any sale that does not involve suitable spotted owl habitat.

Type A habitat is generally the highest quality habitat with known owl sites. It includes optimal old growth forest. Type B habitat is a mature forest habitat but does not contain known owl sites. Type C habitat is considered marginal habitat, usually younger stands with some old growth, though owl sites have been located there.

Other Department Efforts

In addition to the restrictions on timber harvest, the department is undertaking the following activities:

1. Deferring timber harvest on 15,000 acres on the Olympic Peninsula. See the introduction to the Forest Resource Plan and the discussion section for Policy No. 6 (Western Washington Ownership Groups) for additional information.

2. Conducting research to determine if and how its activities can be performed in a manner compatible with the habitat requirements of the Northern Spotted Owl and other wildlife species associated with late successional forests.

3. Cooperating with the Department of Wildlife, the Washington Forest Protection Association and other major corporate landowners to develop and conduct field training sessions for biologists, foresters and landowners to improve their ability to recognize and understand owl habitat.

4. Exploring opportunities under sections 10 and 4(d) of the Endangered Species Act to enter into habitat conservation plans (HCPs). Any HCPs will be reviewed under NEPA and SEPA, which require agencies to evaluate major actions significantly affecting the environment.

5. Finally, the department is an active participant with other state agencies in the federal government's Owl Recovery Plan. That plan may recommend permission for select "taking" of owl habitat in certain parts of state forest land if additional protection of the owl is provided for in other designated areas. The department anticipates that the publication of the draft and final Owl Recovery Plans may significantly affect the department's efforts to protect the owl.

For the purposes of this FEIS, the department adopts by reference Chapter 3, Affected Environment, the Final Supplement (1988) to the Environmental Impact Statement for an Amendment to the Pacific Regional Guide (May 1984), prepared by the Pacific Northwest Region, USDA Forest Service. This chapter describes the environment in the Pacific Northwest that will be affected by federal standards and guidelines for managing spotted owl habitat.

8.4.2.4 Barriers and/or Corridors

Timber harvesting will create both barriers to and corridors for wildlife. Clearcut areas may prevent or reduce movement of some species that prefer forested areas. Logging roads, if heavily travelled, may also function as barriers. Little-travelled roads will likely be used by highly mobile animals as corridors.

The reforestation methods chosen by the department may form barriers and corridors for fauna by altering vegetative patterns. Some animals (for example, deer, hunting hawks and coyotes) prefer open spaces and will use those areas opened up by harvesting and/or site preparation. Other species, however, avoid open areas.

8.4.2.5 Mitigation Measures (Fauna)

The most serious impacts of timber harvesting on terrestrial fauna and fish result from removal and destruction of habitat by clearcutting.

Much can be done to protect special wildlife habitats through careful harvest unit planning and design. The department complies with the Forest Practices Act and regulations, which mitigate these impacts on fauna.

In addition, several specific policies in the Forest Resource Plan will help mitigate potential adverse effects:

1. The watershed policy (No. 19) requires a risk analysis on all large drainage basins and will identify operations which could damage natural resources.

2. The public access policy (No. 25) gives greater latitude to the department to control public access to roads at certain times of the year and will assist the department in protecting fragile areas or parts of state forest land that are used for nesting or breeding.

3. The silviculture policy (No. 30) directs the department to provide extra protection for certain resources, such as wildlife, when necessary.

4. The riparian area policy (No. 20) directs the department to protect Type 4 waters and, if necessary, Type 5 waters. This added protection may reduce the amount of timber harvesting and road construction in these zones. The policy will also allow the department to leave more reserve trees that will eventually form large organic debris (LOD) in streams for habitat and wildlife cover. The inclusion of wall-based channels in riparian areas of variable widths will help protect overwintering juvenile fish.

5. The wildlife policy (No. 22) directs the department to consider the effects of its action on wildlife and to attempt to find balanced solutions to the problem of providing wildlife habitat capability on state forest land, consistent with trust obligations. Leaving large snags, logs and other debris will help maintain diversity and distribution of animals.

The wildlife policy, in addition to the existing Forest Practices regulations, will help protect habitat for the peregrine falcon, Columbian white-tailed deer and grizzly bear, bald eagle, Northern Spotted Owl and other wildlife.

6. The endangered, threatened and sensitive species policy (No. 23) provides that where federal regulations require, the department will take precautions to protect the habitat of endangered and threatened species. In all cases where these species are known to occur on state forest land, the department restricts potentially harmful activity until the situation and applicable law can be investigated.

7. The special lands policy (No. 13) directs the department to preserve special ecological features on state forest land, if appropriate levels of funding are available to compensate the trusts and remove the areas in question from trust status. These lands are then managed as preserves or conservation areas.

8. The wetlands policy (No. 21) requires the department to avoid a net, overall loss of naturally-occurring wetlands on state forest lands.

8.4.2.6 Unavoidable Adverse Impacts (Fauna)

The number and diversity of animal species may be reduced by extensive timber harvesting. Adverse impacts on many animal species cannot be entirely avoided. In some instances, timber harvesting may alter habitat to such an extent that some animals are forced to seek habitat elsewhere. Although the department follows applicable federal and state law, some harvest activities may impact old-growth dependent species by reducing future and current habitat. Soil microfauna may also be destroyed.

Aquatic fauna may likely to be affected adversely from an increase in stream sediment, turbidity and temperature.

In many cases, timber harvesting may create barriers that also adversely impact fauna. The department will attempt to minimize these impacts, though some detrimental effects may be unavoidable.

8.5 SOCIAL EFFECTS

8.5.1 Noise

Logging operations generate some noise, regardless of the type of equipment used. The situations in which noises from the state forest land will affect the public are limited. Most department-managed land is remote and not close to homes or businesses. Furthermore, virtually all timber management activities are conducted in daylight.

Timber harvesting generates relatively high noise levels at the point of equipment operation. The impact of this noise varies considerably, depending on the source and magnitude of sound, distance from sound to receiver, the weather, and intervening topographic and vegetative characteristics. Both road construction and timber harvesting may involve a number (typically four to six) of noise sources (chain saws, earth movers, trucks, yarders, tractors, skidders, etc.) operating at once. These sources can be expected to produce a composite noise level of 85 dBA, measured 50 feet away. Particular conditions significantly modify noise levels and may increase or decrease the amount of noise that is heard. Logging crews are required by state regulations to wear protective hearing equipment.

In commercial forests close to populated areas or near areas of heavy public use, residents may occasionally hear equipment noise. In rare instances, noise levels may cause annoyance and give rise to complaints.

8.5.1.1 Mitigation Measures (Noise)

Existing state regulations specify that logging activities are exempt from the state's "maximum environmental noise standards," except under certain conditions between 10 p.m. and 7 a.m.

8.5.1.2 Unavoidable Adverse Impacts (Noise)

Operation of ground equipment during timber harvest unavoidably generates noise. Impact of these noises on the public will vary considerably, depending upon the sources and magnitude of sound, distance from sound to hearer, intervening topographic and vegetative characteristics, and weather.